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RE-ENTRY HEATING OF SPACE VEHICLES

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RE-ENTRY HEATING OF SPACE VEHICLES

In the not to distant future a rocket sent to a strange planet should land on it, but entering the atmosphere the surface of the rocket heats up to some thousands of degrees. Not a single rocket built out of the heat-resistant materials known up to the present time is able to withstand such a temperature - the rocket either burns up or is melted.

There is no overcoming of the heat barrier head on. Braking engines use a lot of energy. Heat-resistant coatings and coatings with great heat capacity increase the weight. The point is that each extra kilogram means the use of extra hundreds of kilograms of fuel. Cooling the surface of the rocket with the aid of liquid helium or hydrogen also has very definite shortcomings. There is a variant of "avoiding the heat with a shield" - it burns, but let it burn! It is necessary only in the most exact way to compute the time and the rate of the burning and set down the ship just when the heat shield is burnt out and dumped and there no longer any danger for the ship.

But there is one little "but." Even the best electronic machines after having operated for several hour will give rough, only very approximate evaluation, of the time and rate of the burning. The mathematician G. A.

Tirskiy proposed a method with the aid of which it is possible without having recourse to the use of machines precisely to calculate the time of the burning of heat-protection coatings of a rocket. His method takes into account all the basic factors connected with the process of the burning of heat resistant materials in the atmosphere. And there is again a little "but" --- for this there is necessary precise information about the chemical composition of the atmosphere of the planet selected.